

Lomandra phillipsiorum Jian Wang ter (Laxmanniaceae), a new species from south-eastern Queensland

Jian Wang

Summary

Wang, J. (2021). *Lomandra phillipsiorum* Jian Wang ter (Laxmanniaceae), a new species from south-eastern Queensland. *Austrobaileya* 11: 19–25. *Lomandra phillipsiorum* Jian Wang ter is described, illustrated and compared to putatively related species such as *L. filiformis* (Thunb.) Britten. The new species is known only from the Mt Glorious – Mt Nebo area, north-west of Brisbane. Notes on its distribution (including a map), habitat, phenology and affinities are provided. A conservation status of Least Concern is recommended.

Key Words: Laxmanniaceae; *Lomandra*; *Lomandra phillipsiorum*; Australia flora; Queensland flora; taxonomy; new species

Jian Wang, Queensland Herbarium, Department of Environment and Science, Brisbane Botanic Gardens, Mt Coot-tha Road, Toowong, Queensland 4066, Australia. Email: jian.wang@des.qld.gov.au

Introduction

Lomandra Labill. is a genus of four sections currently with 56 species in Australia, with two species extending to New Guinea and one species in New Caledonia (Lee & Macfarlane 1986; CHAH 2006; Wang & Bean 2017; Wang 2018, 2019). The genus was revised for New South Wales by Lee (1966) and for Australia by Lee & Macfarlane (1986). Currently, there are 16 recognised species in Queensland (Wang 2019). *Lomandra* has had various family placements over the past decades, such as Xanthorrhoeaceae (Lee 1966; Lee & Macfarlane 1986), Dasypogonaceae (Briggs 1986; Chase *et al.* 1995) and Laxmanniaceae (Chase & Stevens 1998). The genus has most recently been placed in a broadly circumscribed Asparagaceae in subfamily *Lomandroideae* based on corroborating morphological and phylogenetic evidence (Barrett 2018; Govaerts *et al.* 2020; Gunn *et al.* 2020).

The new species described here was brought to my attention by Susan and Brian Phillips. It brings to thirteen, the number of *Lomandra* species found in the South East Queensland Bioregion, and is the first to be considered endemic to basalt substrates.

Materials and methods

This study is based on morphological examination of *Lomandra* material at the Queensland Herbarium (BRI). All measurements are based on fresh and dried material, except the dimensions of florets, which are based on material reconstituted with boiling water. Dimensions of measurements are inclusive, i.e. 1.0–1.7 is given as 1–1.7.

Common abbreviations in the specimen citations are Mt (Mountain, except where part of a National Park or State Forest name) and NP (National Park).

Taxonomy

***Lomandra phillipsiorum* Jian Wang ter sp. nov.**, resembling *L. filiformis* (Thunb.) Britten but differing in the 3-toothed leaf tips, the inflorescences of simple and significantly shorter racemes, violet to purple flowers, shorter fruiting styles and transverse wrinkled capsules with yellow-coloured stripes. **Typus:** Australia. Queensland. MORETON DISTRICT: D’Aguilar National Park (Boombana), c. 100 m along Thylogale Track from Boombana car park towards Jollys Lookout, D’Aguilar Range, 8 October 2016, S.P. Phillips 2722B & B.A. Phillips (holo: BRI [AQ857607]).

Plants forming tussocks from condensed ascending rhizomes. Each tussock comprising 1 to 4 tufts. Each tuft up to 1 cm in diameter at the base with leaves arranged irregularly or often distichously. Leaves tough and upright. Leaf sheath margins at first membranous or cartilaginous, fraying into strips or fibres up to 5 cm long, purplish to dark brown. Leaf blades glaucous, scabrid, flat adaxially, slightly to strongly convex abaxially, with 6–16 parallel veins on both sides; the margins mostly minutely denticulate; leaf apex usually with 3 sharp teeth with the middle one usually the longest, to 2.5 mm long (**Fig. 1**). Leaves of male plants are 30–60 cm long, 1.4–2.4 mm wide. Leaves of female plants are 38–67 cm long, 1.4–2.7 mm wide. Male and female inflorescences similar in appearance, 1–6 per tuft, 1/20–1/8 as long as leaves. Male inflorescence comprising simple racemes, subtending bracts at the base up to 8, deltoid, up to 8 mm long and 1.5 mm wide at the base that is usually the widest point; inner bracts (up to 6) membranous, outer 2 bracts with 3 veins each (**Fig. 2**); scape flattened, verrucate, 2–5 cm long, 0.4–0.6 mm broad, light brown near the base, violet to purple towards apex; the rachis slightly flat, irregularly angled or channelled, 2–4 cm long, violet to purple, verrucate; flowers 4–15, solitary, alternate or rarely appearing paired or whorled. Flowers similar ages within each raceme (**Fig. 2**); bracts 1, cucullate, 1.8–3.4 mm long and 0.8–1.5 mm wide, membranous except the major mid-vein, usually completely encircling the pedicel; pedicels terete, erect, 1.3–3.5(–5) mm long, 0.3–0.5 mm wide, pale purplish to brown; buds globular, becoming ovoid at anthesis, violet to purple; perianth segments 6 with distinct outer and inner whorls; outer tepals (sepals) 3, elliptical, free except on the very base, uniform in size, thick with slightly thin whitish margins in texture, 1.4–1.5 mm long, 1.1–1.3 mm wide, violet to purple; inner tepals (petals) 3, broadly elliptical, free except on the base 1/3–1/2, uniform in size, thick with slightly thin whitish margins, 1.1–1.3 mm long, 1.6–1.8 mm wide, violet to purple except for whitish margins and inner surface. Stamens 6, all adnate basally to a swollen centre surrounded by the inner tepals,

3 slightly higher, alternating with inner tepals and 3 slightly lower, alternating with outer tepals; the filament not obvious, 0.1–0.2 mm long, 0.2–0.25 mm diameter; anthers all similar, versatile, *c.* 0.4 mm long and 0.3 mm wide, bright yellow to occasionally creamy yellow (**Fig. 2**); pistillode in the swollen centre very rarely developed, mostly purple; stigma and style not formed. Female inflorescence comprising simple racemes (**Fig. 3**) or rarely as a single branch bearing one flower; scape flattened, smooth to slightly verrucate, 1.5–5 cm long, 0.8–1.5 mm broad, creamy to pale brown; the rachis flat or rarely irregularly angled or channelled, smooth or rarely verrucate, 0.5–2.5 cm long; flowers 2–8, alternate, single or rarely appearing paired or whorled; subtending bracts 4–8, deltoid, up to 15 mm long and 3 mm wide at the base, that is usually the widest point, inner bracts (up to 6) membranous, outer pair with 3–5 veins. Flowers usually similar ages within each inflorescence; bracts 1, cucullate, 1.5–2.2 mm long and 0.8–1.2 mm wide, creamy to pale brown, 4/5–3/4 encircling the pedicel; pedicels 0.8–2 mm long, 0.3–0.5 mm wide, terete or irregularly angled and channelled, purple or creamy to pale brown; buds globular, becoming cup-shaped with age, violet to purple or yellowish brown; perianth segments 6 with distinct outer and inner whorls, violet to purple or sometimes yellowish brown with purple tinges; outer 3 tepals (sepals) ovate, 1.4–1.6 mm long, 1.1–1.3 wide, connate at the base; inner 3 tepals (petals) broadly ovate, 1.8–2 mm long, 1.7–1.9 mm wide, connate near base. Staminodes inconspicuous or sometimes absent, when present lacking filaments and bearing vestigial anthers, 3 inserted on the middle part of inner tepals, 3 alternating with them on the middle of lower part of each inner tepal; pistil conspicuous, styles very short and fused with 3 stigmatic lobes; ovary sessile, nearly globular, 1.3–1.5 mm long, 1.3–1.4 mm diameter, with 3 locules; ovules 1 per loculus. Fruiting pedicels 1.8–6 mm long, single (occasionally appears in groups of 2). Immature fruiting styles 0.2–0.5 mm long, disappearing with age. Capsules obvoid, 6–8 mm long, 5–7 mm diameter, dark brown with

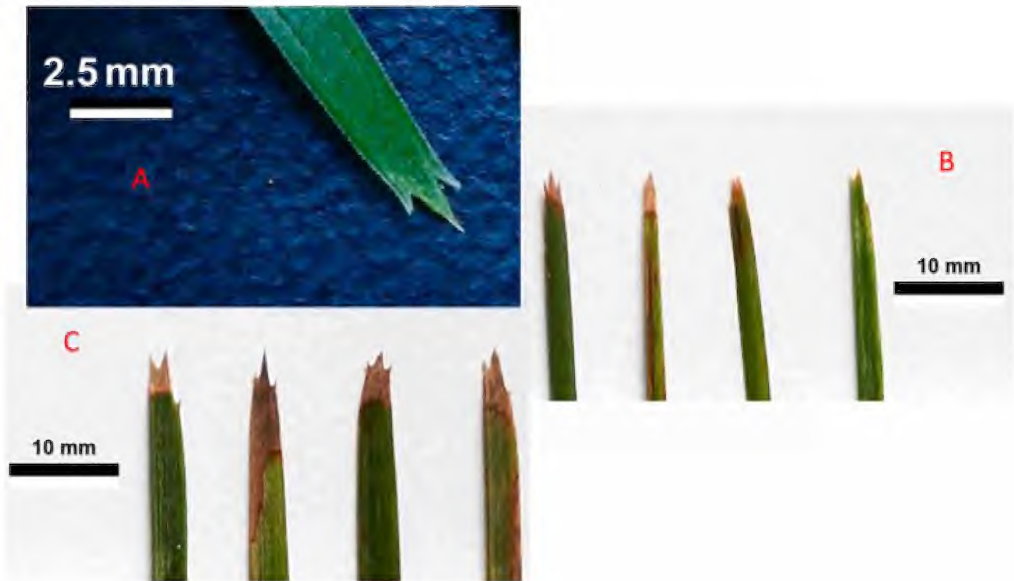


Fig. 1. Leaf tips of *Lomandra phillipsiorum*. A. young male leaf tip. B. mature male leaf tips. C. mature female leaf tips. Scales as indicated. A from Phillips 2722B & Phillips (BRI); B from Phillips 2719 & Phillips (BRI); C from Phillips 2718 & Phillips (BRI). Photos: B. Phillips



Fig. 2. Male plants of *Lomandra phillipsiorum*. A. inflorescences. B. flowers. A & B from Phillips 2629 & Phillips (BRI). Photos: B. Phillips.

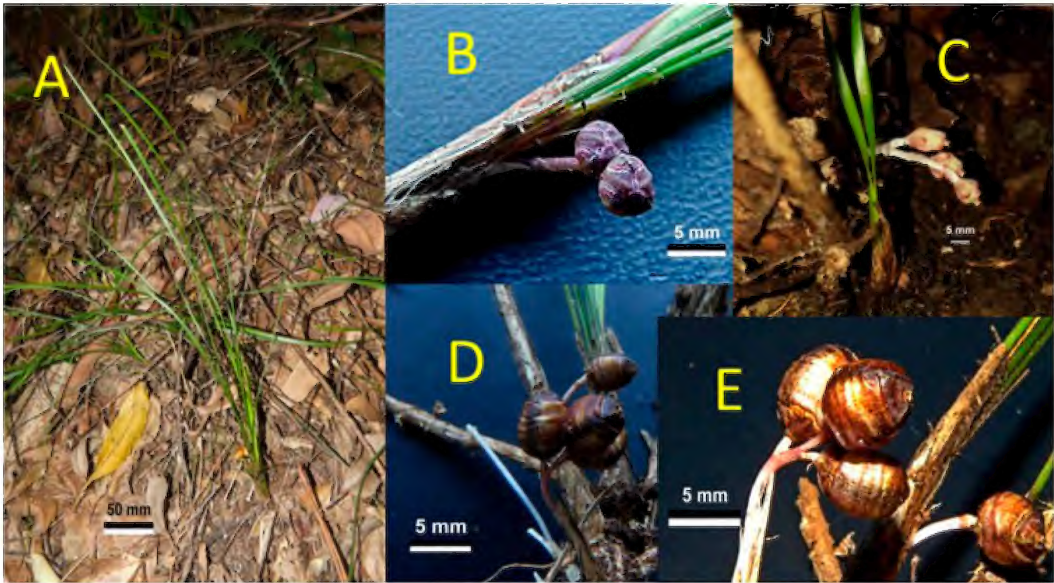


Fig. 3. Female plants of *Lomandra phillipsiorum*. A. habit. B. buds. C. young fruits. D & E. mature fruits. A from Phillips 2718 & Phillips (BRI); B from Phillips 2634 & Phillips (BRI); C from Phillips 3053 & Phillips (BRI); D & E from Phillips 2722B & Phillips (BRI). Photos: B. Phillips.

2–5 transverse yellow stripes when fresh (**Fig. 3D & E**), 1–4 transverse wrinkles near each carpel base, especially after opening; carpel orange-yellowish brown inside; the carpel margins slightly ridged; fruiting perianths, usually 6, leathery, persistent, each 1.8–2.8 mm long, 1.5–2.7 mm wide, bracts leathery, occasionally persistent. Seeds 1 per locule, narrowly ovoid to ovoid, 4.6–5.1 mm long, 2.5–3 mm wide, usually 2-angled on inner face, rounded on outer face, rough or slightly wrinkled, translucent in appearance, light orange to brown.

Additional specimens examined: Queensland. MORETON DISTRICT: Track to Mt D’Aguilar from Lepidozamia Road, c. 1 km along from Tenison Woods Mountain, D’Aguilar Range, Dec 2015, *Phillips 2629 & Phillips* (BRI); Old logging track heading N from Tenison Woods Mountain to Mt D’Aguilar walking track, D’Aguilar Range, Apr 2016, *Phillips 2634 & Phillips* (BRI); Walking track from Tenison Woods Mountain to Mt D’Aguilar, N facing spur off this track, Oct 2016, *Phillips 2718 & Phillips* (BRI); *ibid*, Oct 2016, *Phillips 2719 & Phillips* (BRI); D’Aguilar NP (Boombana), c. 100 m along Thylogale Track from Boombana car park towards Jollys Lookout, D’Aguilar

Range, Oct 2016, *Phillips 2722A & Phillips* (BRI); Morelia walking track to Mt Nebo Lookout from Manorina, D’Aguilar NP, Apr 2018, *Phillips 2935 & Phillips* (BRI); Pitta Circuit, D’Aguilar NP (Boombana), c. 30 m from picnic area (going in clockwise direction), Feb 2020, *Phillips 3025 & Phillips* (BRI); Pitta Circuit, D’Aguilar NP (Boombana), c. 80 m from picnic area (going in clockwise direction), Feb 2020, *Phillips 3026 & Phillips* (BRI); Morelia walking track to Mt Nebo Lookout from Manorina parking area, D’Aguilar NP, Feb 2020, *Phillips 3027 & Phillips* (BRI); *ibid*, Feb 2020, *Phillips 3028 & Phillips* (BRI); Redmans Break, W of Tenison Woods Mountain, D’Aguilar NP, (c. 0.4 km from Northbrook Parkway), Mar 2020, *Phillips 3037 & Phillips* (BRI); Redmans Break, W of Tenison Woods Mountain, D’Aguilar NP, c. 0.7 km from Northbrook Parkway, Mar 2020, *Phillips 3038 & Phillips* (BRI); 0.7 km along Redmans Break from Northbrook Parkway, W of Tenison Woods, D’Aguilar Range, May 2020, *Phillips 3053 & Phillips* (BRI).

Distribution and habitat: *Lomandra phillipsiorum* is endemic to south-eastern Queensland, with a restricted distribution within D’Aguilar NP in a c. 20 km area west of Tenison Woods Mountain and south of Mt Nebo (**Map 1**). The altitude range is from 440

m to 730 m.

The habitat in D'Aguilar NP varies from subtropical rainforest with eucalypt emergents to wet sclerophyll forest with a low rainforest understorey on red-brown krasnozems soils derived from basalt. Some sites have been disturbed by past clearing and receive more light. The tree species usually include *Callitris macleayana* (F.Muell.) F.Muell., *Cinnamomum oliveri* F.M.Bailey, *Cyclophyllum longipetalum* S.T.Reynolds & R.J.F.Hend., *Eucalyptus saligna* Sm., *E. microcorys* F.Muell., *Guioa semiglaucula* (F.Muell.) Radlk., *Lophostemon confertus* (R.Br.) Peter G.Wilson & J.T.Waterh., *Olea paniculata* R.Br., *Pittosporum undulatum* Vent., *Polyscias elegans* (C.Moore & F.Muell.) Harms, *Rhodosphaera rhodanthema* (F.Muell.) Engl., *Synoum glandulosum* (Sm.) Juss. subsp. *glandulosum* and *Trochocarpa laurina* (R.Br. ex Rudge) R.Br. The shrub and ground layers consist of *Ajuga australis* R.Br., *Alpinia caerulea* (R.Br.) Benth., *Arthropodium milleflorum* (DC.) J.F.Macbr., *Billardiera scandens* Sm., *Breynia oblongifolia* (Muell. Arg.) Muell.Arg., *Gymnostachys anceps* R.Br., *Lepidozamia peroffskyana* Regel, *Lomandra longifolia* Labill., *Poa labillardieri* Steud. var. *labillardieri*, *Psychotria loniceroides* Sieber ex DC., *Themeda triandra* Forssk. plus sedges and ferns.

Lomandra phillipsiorum grows in tufts anchored by very strong roots. Individual tufts often stick out at an angle from the base. The tussocks are usually surrounded and buried in dense leaf litter making the visibility of flowers and fruits difficult. Plants occur in restricted areas in quite dense patches (up to 10 tussocks per square metre) or can be more scattered.

Phenology: Male flowering was recorded from February to March. However, it is also recorded in October and December. Female flowering was recorded in March, April, October and December. Mature fruits were collected in April, May and October.

Affinities: *Lomandra phillipsiorum* is putatively closely related to *L. filiformis*, from which it differs most obviously in the 3-toothed

leaf tips (1–3-toothed for *L. filiformis*), significantly shorter inflorescences (1/20–1/8 as long as leaves for *L. phillipsiorum*, while 1/4–1/3 as long as leaves for *L. filiformis*) that are basally cryptic for each fertile rosette, the inflorescences of simple racemes (inflorescences usually well-branched for *L. filiformis*), violet to purple flowers (brown or yellowish brown flowers for *L. filiformis*), and the transverse wrinkled capsules with yellow-coloured stripes (usually uniformly brown-coloured capsules for *L. filiformis*).

Notes: *Lomandra phillipsiorum* is endemic to a small area at Mt Glorious – Mt Nebo where it is parapatric with *L. filiformis*; the latter species has a wide distributional range in eastern Australia from the tip of Cape York to the southern coast of Victoria. In Queensland *L. filiformis* is usually a common species mostly from open forests and woodlands in lowlands and/or coastal areas. However, it is not known to occur from the Mt Glorious – Mt Nebo area.

Conservation status: Currently there are only four locations known within a narrow geographic range for *Lomandra phillipsiorum*; however, it can be a very common species where it occurs. It is recorded from D'Aguilar NP and is not known to be at risk in the wild. Therefore, the species is not considered to be threatened and a **Least Concern** conservation status is recommended using the IUCN (2012) criteria.

Etymology: This species is named for Susan and Brian Phillips. After gaining a science degree at the University of Queensland, Susan worked in plant nematology and entomology, where part of her work involved the illustration of scientific publications. In 1996 she and her husband Brian worked with a team of entomologists in north Queensland in the papaya fruit fly eradication programme. In 1997 Susan joined the Queensland Herbarium, where her work involved the preparation and data-basing of specimens. Since her retirement in 2012 she has been working as a volunteer at the herbarium, mounting specimens and collecting plants for incorporation into the herbarium collection. Brian has a background in engineering

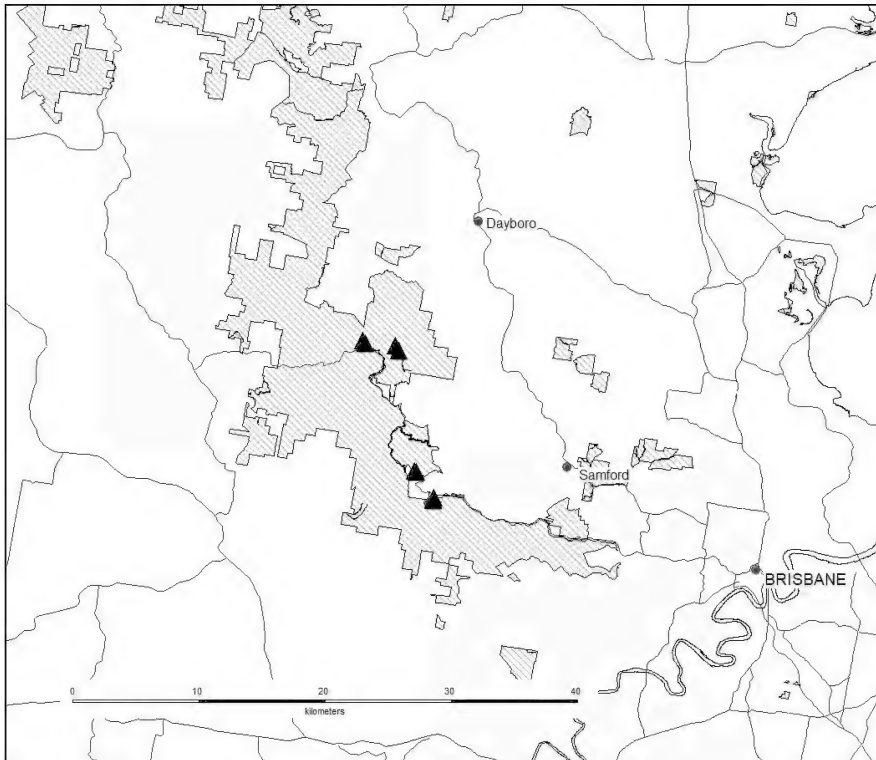
drafting and has pursued his hobby of photography for many years. They both have a keen interest in nature, bushwalking and camping. Together they have collected more than 3,000 plant specimens for the Queensland Herbarium.

Acknowledgements

I am grateful to the following staff at the Queensland Herbarium who helped in the preparation of this manuscript: Mr Tony Bean for reading a late draft and preparation of the distribution map; Dr Gordon Guymer for his support and Dr Paul Forster for constructive comments. I also wish to thank Dr Mats Hjertson, Curator (vascular plants), Uppsala University, Sweden for the type specimen photos of *Lomandra filiformis* at UPS and Mr Brian Phillips for photographs of *L. phillipsiorum*. Sincere thanks to the Directors of DNA, MEL, NSW and NT for providing loan specimens.

References

- BARRETT, M.D. (2018). Three new species of Asparagales from the Kimberley region of Western Australia. *Telopea* 21: 25–37.
- BRIGGS, B. (1986). Chromosome numbers in *Lomandra* (Dasyopogonaceae). *Telopea* 2: 741–744.
- CHASE, M.W. & STEVENS, P.F. (1998). An ordinal classification for the families of flowering plants. *Ann. Missouri Bot. Gard.* 85: 531–553.
- CHASE, M., DUVAL, M.H., HILLS, H.G., CONRAN, J.G., COX, A.V., EGUIARTE, L.E., HARTWELL, J., FAY, M.F., CADDICK, L., CAMERON, K. & HOOT, S. (1995). Molecular phylogenetics of Lilianae. In P.J. Rudall *et al.* (eds.), *Monocotyledons: Systematics and Evolution*, pp. 109–137. Royal Botanic Gardens, Kew: London.
- CHAH (2006). *Australian Plant Census*. IBIS database. <http://chah.gov.au/chah/apc/>, accessed 28 September 2020.
- GOVAERTS, R., ZONNEVELD, B.J.M. & ZONA, S.A. (2020). *World Checklist of Asparagaceae*. Facilitated by the Royal Botanic Gardens, Kew. <http://wcp.science.kew.org/>, accessed 1 August 2020.
- GUNN, B.F., MURPHY, D.J., WALSH, N.G., CONRAN, J.G., PIRES, J.C., MACFARLANE, T.D. & BIRCH, J.L. (2020). Evolution of Lomandroideae: Multiple origins of polyploidy and biome occupancy in Australia. *Molecular Phylogenetics and Evolution* 149: 106836. <https://doi.org/10.1016/j.ympev.2020.106836>
- IUCN (2012). *IUCN Red List Categories and Criteria: Version 3.1*. 2nd edition. Gland, Switzerland and Cambridge, UK: IUCN. iv + 32pp.
- LEE, A.T. (1966). Xanthorrhoeaceae. *Contributions from the New South Wales National Herbarium, Flora Series* 34: 16–42.
- LEE, A.T. & MACFARLANE, T.D. (1986). *Lomandra*. In A.S. George (ed.), *Flora of Australia* 46: 100–141. Australian Government Publishing Service: Canberra.
- WANG, J. (2018). *Lomandra ramosissima* Jian Wang *ter* (Laxmanniaceae), a new species from southern central Queensland. *Austrobaileya* 10: 266–272.
- (2019). *Laxmanniaceae*. In G.K. Brown & P.D. Bostock (eds.), *Census of the Queensland Flora 2019*. Queensland Department of Environment and Science: Brisbane. <https://www.data.qld.gov.au/dataset/census-of-the-queensland-flora-2019>, accessed 5 August 2020.
- WANG, J. & BEAN, A.R. (2017). *Lomandra decomposita* (R.Br.) Jian Wang *ter* & A.R.Bean (Laxmanniaceae), a new species for Queensland. *Austrobaileya* 10: 59–63.



Map 1. Distribution of *Lomandra phillipsiorum* in south-eastern Queensland based on BRI records. The shaded area indicates D'Aguilar National Park.